

REMARKS

Claims 11, 22 and 23 were pending, with claims 1-10 and 12-21 having previously been canceled, without prejudice or disclaimer. By this Amendment, claim 11 has been amended to clarify the claimed subject matter, and new claims 24-31 have been added. Accordingly, claims 11 and 22-31 are now pending, with claims 11, 23 and 24 being in independent form.

Claim 11, 22 and 23 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over U.S. Patent No. 5,764,245 to Yokoi in view of U.S. Patent No. 5,897,961 to Malhotra and U.S. Patent No. 5,670,995 to Kupcho et al.

This relates to improvements to an ink-jet recording apparatus devised by applicant to improve double-sided printing and provide a high-level of image quality on both sides.

In an aspect of this application, an ink-jet recording apparatus includes a memory configured to hold data of one page volume in one chunk for printing a back-side image on a back side of the recording medium, a front-side image having already been printed on a front side of the recording medium, and the image data in the memory for the back-side image is sent to the ink-jet recording head in a reverse sequence so that the image data is printed on the back side of the recording medium from bottom to top direction.

Yokoi, as understood by applicant, proposes a recording apparatus which, in order to avoid needing a large capacity buffer, utilizes instead a line buffer to receive and temporarily store data from a host computer for a scanning line of the image to be printed.

Yokoi, column 3, lines 1-18 and 30-48, is reproduced below:

... said recording medium into said conveying means by rendering a lower end of said recording medium as a front end in a conveyance direction; and ***a line buffer memory for temporarily storing serial recording data of one scanning line of said recording means***, said recording data being expandable to H stages and M columns, wherein in a double side recording mode, said recording means records one side of said recording medium; said recording medium is conveyed in rendering an upper end

of said recording medium as a front end in the conveyance direction by *reversely rotating said conveying means after made to pass through said passage and set at a recording commencement position for the other side thereof*, and *said recording means records on the other side of said recording medium by transmission from said line buffer memory to said recording means said serial recording data* reversely permuted so that data at the H stage and the M column constitute data at said first stage and said first column.

...
Although in a recording process for the other side, the recording means faces to the recording medium in a condition that the data are reversed with respect to stages and columns against the serial recording data expandable to H stages and M columns, the recording means can perform recording work at the similar position and similar scanning direction to those of recording on one side because the reversed serial data in which *data of the stage H and the column M constitute data of the first stage and the first column are transmitted from the line buffer memory to the recording means*.

Thus, even for recording work for the other side, the recording apparatus records in a direction from the upper end to the lower end of the recording medium, so that *it is enough for the recording apparatus to hold the serial recording data only of one scanning line of the recording means sequentially sent out of a host computer, and so that a large capacity buffer memory will be unnecessary.*"

Thus, Yokoi teaches that the recording apparatus records the image on the back side in a direction from the upper end to the lower end of the recording medium.

Contrary to the contention in the Office Action, Yokoi does not teach or suggest that the image data in the memory for the back-side image is sent to the ink-jet recording head in a reverse sequence so that the image data is printed on the back side of the recording medium from bottom to top direction (independent claims 11, 23 and 24 of the present application).

Moreover, Yokoi specifically teaches that utilizing the recording apparatus proposed therein avoids the use of a large capacity buffer memory, and therefore teaches away from an ink-jet recording apparatus including a memory configured to hold data of one page volume in one chunk for printing a back-side image on a back side of the recording medium, a front-side image having already been printed on a front side of the recording medium.

Indeed, the United States Supreme Court recently reiterated in the KSR case that teaching away is indicative of nonobviousness of a patent claim.

Therefore, Yokoi, even considered in combination with other references, common sense and common knowledge to one skilled in the art, simply would not have rendered obvious the claimed subject matter of the present application, that is, an ink-jet recording apparatus including a memory configured to hold data of one page volume in one chunk for printing a back-side image on a back side of the recording medium, a front-side image having already been printed on a front side of the recording medium, wherein the image data in the memory for the back-side image is sent to the ink-jet recording head in a reverse sequence so that the image data is printed on the back side of the recording medium from bottom to top direction.

Malhotra and Kupcho do not teach or suggest such an ink-jet recording apparatus.

Malhotra, as understood by applicant, proposes coated photographic papers comprising cellulosic substrate having a thickness between 50 microns to 250 microns, and on which various coating agents can be applied.

Kupcho, as understood by applicant, proposes an apparatus for simultaneous double-sided printing.

In the apparatus proposed by Kupcho, both sides are printed simultaneously. For this purpose, two inkjet heads are provided on respective sides of the paper, each head being provided with its own memory, and, with the use of the memories, printing is made for both sides simultaneously.

In contrast, in the subject matter of claim 11 of the present application, after a front side is printed, then a reverse side is printed. That is, the apparatus includes a memory configured to hold data of one page volume in one chunk for printing a back-side image on a back side of the

recording medium, a front-side image having already been printed on a front side of the recording medium.

Malhotra and Kupcho, even considered in combination with common sense and common knowledge to one skilled in the art, does not teach or suggest an ink-jet recording apparatus including a memory configured to hold data of one page volume in one chunk for printing a back-side image on a back side of the recording medium, a front-side image having already been printed on a front side of the recording medium, wherein the image data in the memory for the back-side image is sent to the ink-jet recording head in a reverse sequence so that the image data is printed on the back side of the recording medium from bottom to top direction (independent claims 11, 23 and 24 of the present application).

Further, as noted above, the teaching away by Yokoi, as pointed out by the U.S. Supreme Court, cannot be ignored.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any required fees, and to credit any overpayment, to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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